



**MACKAY FISH HATCHERY
F-81-D-5**

By:

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INTRODUCTION

The Mackay Hatchery is a specialty fish production station located approximately 12 miles north of the town of Mackay in Custer County, Idaho. The hatchery produces salmonids of various species and strains, from 1 to 16 inches in length, for statewide distribution. Funding for operational costs is obtained under contract from the Federal Aid in Sport Fish Restoration Program, more commonly known as Wallup-Breaux, and from state license monies for fish feed.

FISH PRODUCTION

Net production for 1994 was 4,146,874 fish weighing 117,521.6 pounds (Appendix 11). The formula used for computing net production pounds is as follows:

$$\begin{array}{r} \text{Pounds on Hand 12/31/93} \\ - \text{Pounds on Hand 1 /1 /93} \\ + \text{Pounds Stocked Out} \\ - \text{Pounds Transferred in} \\ \hline = \text{Net Poundage Produced} \end{array}$$

A total of 13,582,486 inches of fish were stocked out of the hatchery. In other words, if all of the fish stocked out of the Mackay Hatchery in 1994 were laid end to end, they would stretch for over 214 miles. The cost of fish produced averaged \$1.814 per pound, \$0.0514 per fish, and \$.01569 per inch. As the report period for the Annual Report does not coincide with the fiscal year, costs are computed by the following formula:

$$\frac{\text{FY94 Budget Total} + \text{FY95 Budget Total}}{2}$$

Budget totals include personnel and operating costs, but not capital outlay or transportation costs.

Included in the year's production were 14 lots, comprised of 5 species and 9 different strains, as follows:

Rainbow trout

Arlee (MT) (2 year classes)

Hayspur (ID) (R9) (2 year classes)

Troutlodge (WA)

Cutthroat trout

Westslope (2 year classes)

Henrys Lake

Brown trout

Saratoga (WY) (2 year classes)

Rainbow x Cutthroat trout hybrids

Kokanee salmon

Early (KE) run (2 year classes)

October (KO) run (Blue Mesa Reservoir, Colorado)

Early kokanee salmon Oncorhynchus nerka kennerlyi received as green eggs from the Deadwood Reservoir trap performed poorly in 1994, perhaps because of low water levels and high temperatures in Deadwood Reservoir during the summer of 1994. Eye-up dropped from 90% in 1993 to 60% in 1994.

In the spring of 1994, Hayspur rainbow trout O. mykiss were hatched as an experiment to test that strain's performance at this hatchery. Survivability to 1.5 inches in length was 86%. If necessary, this should prove to be a highly appropriate alternative to Arlee rainbow in the future.

WATER SUPPLY

During 1994, the water volume available for hatchery production stayed remarkably constant, considering that the area has been in a drought for seven years. Flows ranged from 18 to 23 cubic feet per second (cfs), which is comparable to historical levels. Prior to the earthquake of 1983, water temperature at the Mackay Hatchery was said to be a constant 52°F. After that earthquake, it became apparent that three springs supplied water to the hatchery; one at 49°F, one at 51°F, and one at 54°F. For some time after the earthquake, the temperature in the production raceways remained at 54°F. Since that time, the water temperature in those raceways

has followed a downward trend, reaching 49°F during 1994. This has been the result of decreasing flows in the 54°F spring, and increasing flows in the 49°F spring. This may be a warning of changing flows in the future.

HATCHERY IMPROVEMENTS

The roof on the shop/feed storage building was replaced with galvanized roofing. The hatchery effluent settling and evaporation pond was enlarged and deepened. A safety fence was built around the tailrace for the safety of employees and visitors. The 400-gallon fish hauling tank was remodeled with a Point 4 oxygen system to increase hauling capacity and enhance fish health at release. As part of the hatchery maintenance program, the exterior of the garage at residence #1 was cleaned, scraped, and repainted. Sunscreens were built to calm wilder strains of fish in the large raceways. Nursery troughs were patched in the hatchery building. Aluminum-framed, perforated-plate fish screens were built for the large and small raceways. Large raceway walls were patched as part of the overall maintenance program.

FUTURE NEEDS

A retaining wall, or clay bed, will need to be installed between the spring and residence #1. That residence is below the level of the spring and is in constant danger of flooding. The spring cobble area will need cleaning with a backhoe. The furnace and wood stove in residence #3 are near the end of their useful life. The siding on residence #3 is now 36 years old. It is cracking and warping and needs to be replaced. Additional replacement incubators and nursery troughs are needed for the hatchery building. Residence #3 has never had a garage for the employee living in that house. As the Mackay area has severe winters, a garage should be built.

FISH STOCKED

Fingerling of various species and strains were stocked in 5 regions of Idaho (Appendix 1). These put-grow-and-take fish numbered 3,491,734 fish weighing 48,225.6 pounds.

Catchable rainbow trout (8 inches +) were stocked in the Upper Snake and Salmon regions. These put-and-take fish numbered 139,140 fish weighing 76,028 pounds.

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The fish transport tanker trucks assigned to the Mackay Hatchery traveled on 134 fish stocking trips during the year, and logged over 35,000 miles. Transport tankers assigned to Fish Transportation hauled eight loads during the year. Sixty-one high mountain lakes in the Magic Valley and Upper Snake Regions were stocked using helicopters.

In addition to Mackay's normal production of 11-inch catchables, 16,233 rainbow catchables ranging from 14 to 16 inches in length (nicknamed "Mackay Magnums") were stocked in Ririe Reservoir. This has been found to produce higher return-to-the-creel than stocking 70,000 smaller catchables, as was done in past years.

EGGS SHIPPED

Thirty-five thousand eyed early (Deadwood) kokanee eggs were shipped to the Troutlodge hatchery at Hood River, Oregon.

FISH SPAWNING

The run of October kokanee in Paulina Lake, Oregon was much later, and numbers were down significantly from past years. No eggs were available from that source this year.

FISH FEED

Fish feed used during the year totaled 119,872 pounds at a cost of \$39,435.08. Feed conversion averaged 1.02 pounds of feed per pound of fish produced. Feed cost per pound of fish produced was \$0.3355. Feed cost per inch produced was \$0.0029.

BioDiet, BioDry 1000, BioDry Trout, Rangen SoftMoist diet, and Nelson's Sterling Silver Cup dry and SoftMoist trout and salmon diets were used, depending on the different nutritional needs of different strains.

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PUBLIC RELATIONS

Approximately 800 people toured the hatchery during the year. Due to the remote location and unfavorable climate of the hatchery, few people actually seek it out. Most are hunters and fishermen who visit here incidental to other activities.

Hatchery tours were given to two school groups. An on-camera interview was given to the local NBC television affiliate. A presentation was given to an elementary school group at the Arco Library explaining anadromous fish migration issues. The hatchery crew and the local conservation officers participate in Idaho's "Adopt-A-Highway" litter control program. Six miles of Highway 93 along Mackay Reservoir are cleaned twice yearly.

FISH FIN CONDITION

Using the "Ashton Method" for measuring fin condition of production fish raised at the Mackay Hatchery, measurements were taken several times during the planting season.

Fins measured 60% of wild fish fins for Arlee rainbow catchables. Fingerling fins measured 73% of wild fish fins for Hayspur rainbow; 61% of wild fish fins for westslope cutthroat; 82% of wild fish fins for brown trout; 89% of wild fish fins for rainbow X cutthroat hybrids; 78% of wild fish fins for Henrys Lake cutthroat, and 81% of wild fish fins for early kokanee.

FISH MARKING

Ten percent (100,000) of the Henrys Lake cutthroat trout O. clarki stocked in Henrys Lake were adipose fin-clipped prior to stocking.

ACKNOWLEDGMENTS

During 1994, the Mackay Hatchery crew included Bill Doerr, Fish Hatchery Manager I; Robert Hoover, Assistant Fish Hatchery Manager; Mel Hughes, Fish Culturist; and at different times, Jason Rheinhardt, Terry Warner, and Rebekah Steffler, Biological Aides. Manpower available and expended totaled 36 permanent and 15 temporary man-months.

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Appendix 1. Fish production at Mackay Fish Hatchery, January 1 to December 31, 1994.

| Species/Strain | Lot number | Source | Received as | Number/lb received or carried over | Yield (Number/lb) | Destination, Comments |
|--|------------|--------------------------|-------------|--|------------------------|---|
| Hayspur rainbow | 4-U-Id-R9 | Hayspur | eyed eggs | 28,750/ eggs | 24,812/ 190 | Experimental rearing |
| Hayspur rainbow | 5-U-Id-R9 | Hayspur | eyed eggs | 289,145/ eggs | 245,773/ alevins | 1996 catchables, Hagerman Hatchery, 1995 |
| Arlee rainbow | 3-En-RA | Ennis NFH | eyed eggs | 108,000/ 36,000 ^a | 115,334/ 71,628 | 1994 catchables |
| Arlee rainbow | 4-En-RA | Ennis NFH | eyed eggs | 135,000/ 45 ^a | 131,800/ 34,400 | 1995 catchables, 1994 fingerlings |
| Kamloops Troutlodge | 4-U-Id-20 | Nampa | fry | 22,040/ 40 | 22,900/ 45,8 | High mountain lakes |
| Westslope cutthroat | 3-U-Id-C2 | McCall | fry | 20,600/ 317 ^a | 20,000/ 1,525 | Payette Lake net pen 1994 |
| westslope cutthroat | 4.-U-Id-C2 | McCall | fry | 19,000/ 28,3 | 16,000/ 157 | Payette Lake net pen 1995 |
| westslope cutthroat Henrys Lake | 4-U-Id-C3 | Henrys Lake | eyed eggs | 1,564,998/ eggs | 1,090,174/ 16,370.8 | Region 6 high mountain lakes, Henrys Lake, Sublett |
| Plymouth Rock brown trout | 3-Sr | Saratoga NFH Wyoming | eyed eggs | 116,000/ 36 ^a | 115,951/ 1,576 | Regions 4 and 6 fingerlings, 1994 |
| Plymouth Rock brown trout | 4-Sr | Saratoga NFH Wyoming | eyed eggs | 205,269/ eggs | 165,000/ alevins | Regions 4, 5, and 6 fingerlings, 1995 |
| rainbow x cutthroat | 4-U-Id-RC | Henrys Lake | eyed eggs | 1,232,223/ eggs | 814,900/ 11,920 | Regions 3 and 6 |
| Deadwood kokanee | 3-U-Id-KE | Deadwood Reservoir | green eggs | 1,420,000/ 675 ^a | 1,402,997/ 16,598 | Regions 2, 3, 4, 5, and 6, 1994 |
| Deadwood kokanee | 4-U-Id-KE | Deadwood Reservoir | green eggs | 1,136,752/ eggs | 500,000/ 43 | Regions 2, 3, 4, 5, and 6, 1995 (+35,000 eyed eggs shipped) |
| Blue Mesa kokanee | 4-U-Co-KO | Roaring Judy Colorado | eyed eggs | 605,088/ eggs | 500,000/ alevins | Salmon Falls Reservoir, Lucky Peak Reservoir, 1995 |
| ^a Denotes numbers and pounds of fish carried over from previous year. | | | | | | |

Submitted by:

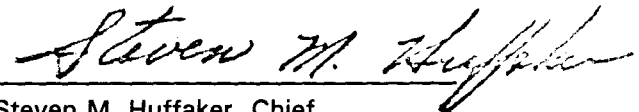
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Approved by:

IDAHO DEPARTMENT OF FISH AND GAME



Steven M. Huffaker, Chief
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Funds Expended:

| | |
|----------|-----------|
| State: | \$51,167 |
| Federal: | \$153,450 |
| Total: | \$204,617 |



Al Van Vooren
Fishery Research Manager